

Assessment of Polychlorinated Biphenyls Concentration in Egg Using GC-MS Method

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Abstract

Background and purpose: Organic chlorine pollutants are stable in the environment and dangerous to the health of living organisms. Among these compounds, polychlorinated biphenyls (PCBs) can be carcinogenic to humans and affect brain function, nervous system, reproductive system, and the immune system. They could enter the body through many ways including eating or drinking contaminated water and food such as chicken egg.

Materials and methods: Sampling of 4 brand of chicken eggs was performed in all seasons in Tehran, Iran 2017. The mixed solvent of Hexane: Dichloromethane (same ratio) was used for extraction applying ultrasonic method. Then, the two phases were separated using concentrated sulfuric acid. They were then condensed by a rotary machine with a vacuum pump under a gentle nitrogen gas and purified using silica gel column or florisil. Finally, the concentration of each PCB was measured by the GC-MS device.

Results: In all samples, the mean polychlorinated biphenyls (1.40 ± 0.3 pg WHO-TEQ /g fat) was lower than the standard range and the highest concentration was associated with PCB 28 (mean value= 0.802 pg WHO-TEQ / g fat). One of the brands (B) had the highest average of PCBs, and the most contaminated eggs were found in winter (1.822 pgWHO-TEQ/g fat).

Conclusion: In this study the average of each PCB was lower than the standard values in different types of eggs, indicating no risk to the consumers.

Keywords: polychlorinated biphenyls, egg, gas chromatography-mass (GC-MS)

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